National Institute of Environmental Health Sciences

The influence of temperature and humidity on the incidence of hand, foot, and mouth disease in Japan

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Year: 2011
Journal: The Science of The Total Environment. 410: 119-125

Abstract:

Background: The increasing evidence for rapid global climate change has highlighted the need for investigations examining the relationship between weather variability and infectious diseases. However, the impact of weather fluctuations on hand, foot, and mouth disease (HFMD), which primarily affects children, is not well understood. Methods: We acquired data related to cases of HFMD and weather parameters of temperature and humidity in Fukuoka, Japan between 2000 and 2010, and used time-series analyses to assess the possible relationship of weather variability with pediatric HFMD cases, adjusting for seasonal and interannual variations. Results: Our analysis revealed that the weekly number of HFMD cases increased by 11.2% (95% CI: 3.2-19.8) for every 1 degrees C increase in average temperature and by 4.7% (95% CI: 2.4-7.2) for every 1% increase in relative humidity. Notably, the effects of temperature and humidity on HFMD infection were most significant in children under the age of 10 years. Conclusions: Our study provides quantitative evidence that the number of HFMD cases increased significantly with increasing average temperature and relative humidity, and suggests that preventive measures for limiting the spread of HFMD, particularly in younger children, should be considered during extended periods of high temperature and humidity.

Source: http://dx.doi.org/10.1016/j.scitotenv.2011.09.055

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Meteorological Factors, Temperature

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: Other Asian Country

Other Asian Country: Japan

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease, Other Health Impact

Other Health Impact: hand, foot, and mouth disease

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Children

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified